Preparations for the Breakout Sessions

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Technical Board
July 29, 2004

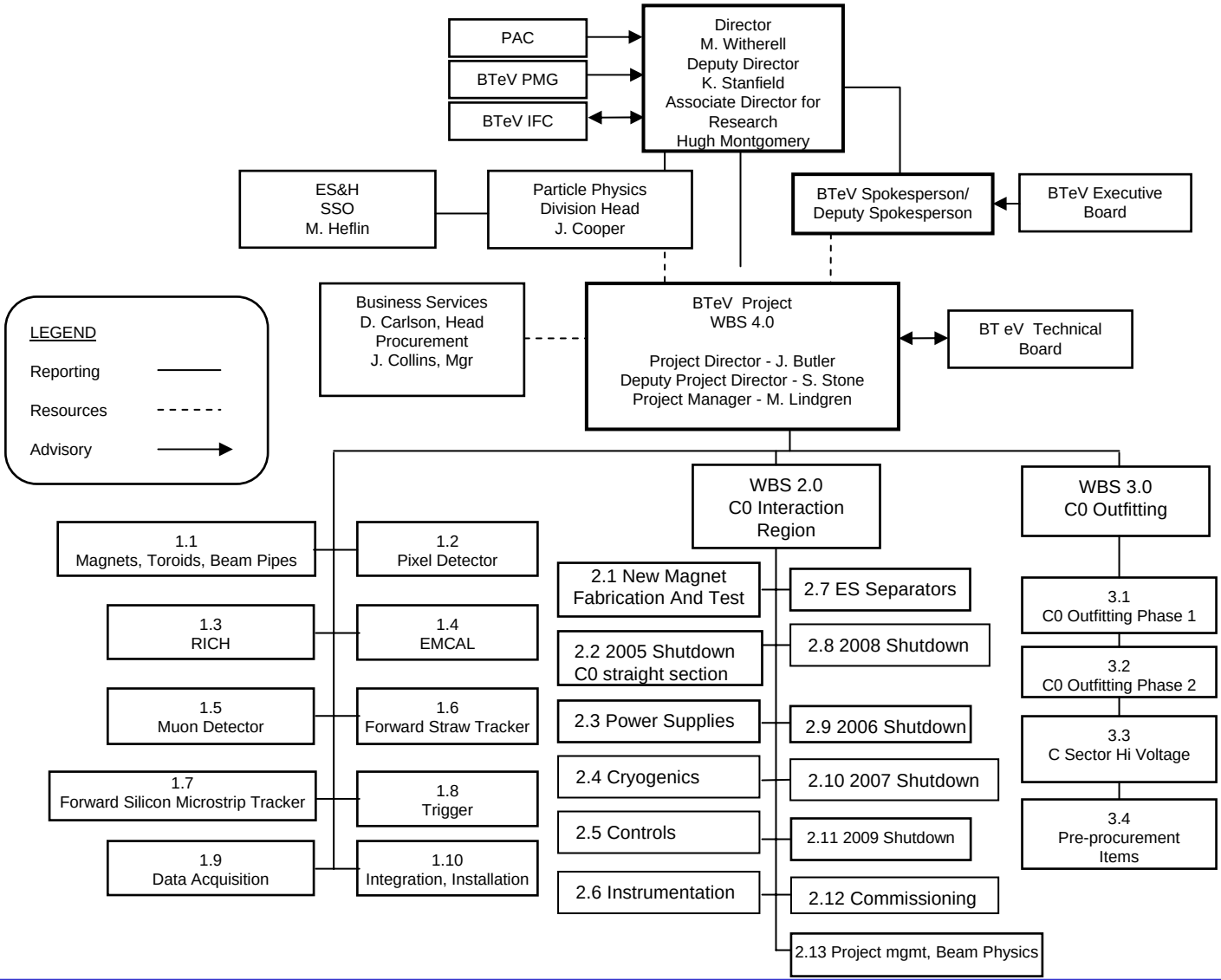
Presentations

- PMP Highlights
  - OBS
  - Roles and Responsibilities
  - Change control process
- Schedule
  - Baseline method
  - Tiered milestones
- Subproject Documentation
  - Notebook Contents
- Open Plan schedule contingency demo – Bill Freeman
- Obrowser Cost and Note Drill Down Usage – Erik Gottschalk

Project Management Plan

- Defines the project in terms of lab and project responsibilities.
  - Cover mission need – S. Stone talk
  - Organizational structure
  - Roles and responsibilities
  - Resource requirements
  - Baselines
  - ISM
  - Acquisition Strategy
  - Technical Considerations
  - Project controls

OBS


PAC
BTeV PMG
BTeV IFC
Director
M. Witherell
Deputy Director
K. Stanfield
Associate Director for Research
Hugh Montgomery
ES&H
SSO
M. Heflin
Particle Physics
Division Head
J. Cooper
BTeV Spokesperson/
Deputy Spokesperson
BTeV Executive Board
LEGEND
Reporting
Resources
Advisory
Business Services
D. Carlson, Head
Procurement
J. Collins, Mgr
BTeV Project
WBS 4.0
Project Director - J. Butler
Deputy Project Director - S. Stone
Project Manager - M. Lindgren
BT eV Technical Board
WBS 2.0
C0 Interaction Region
WBS 3.0
C0 Outfitting
1.1
Magnets, Toroids, Beam Pipes
1.2
Pixel Detector
1.3
RICH
1.4
EMCAL
1.5
Muon Detector
1.6
Forward Straw Tracker
1.7
Forward Silicon Microstrip Tracker
1.8
Trigger
1.9
Data Acquisition
1.10
Integration, Installation
2.1 New Magnet Fabrication And Test
2.2 2005 Shutdown C0 straight section
2.3 Power Supplies
2.4 Cryogenics
2.5 Controls
2.6 Instrumentation
2.7 ES Separators
2.8 2008 Shutdown
2.9 2006 Shutdown
2.10 2007 Shutdown
2.11 2009 Shutdown
2.12 Commissioning
2.13 Project mgmt, Beam Physics
3.1
C0 Outfitting Phase 1
3.2
C0 Outfitting Phase 2
3.3
C Sector Hi Voltage
3.4
Pre-procurement Items

Roles and Responsibility highlights

- 4 divisions and FESS critical to success of project
- PPD is host Division for Project
  - Primary source of Fermilab manpower and technical resources for the Detector
  - Supports Project Office
- CD
  - Provides a significant fraction of the resources in the area of Trigger (WBS 1.8) and Data Acquisition (WBS 1.9)
  - Includes both hardware and software
- AD
  - Provides resources for the IR subproject
  - Responsible for the design of the Interaction Region and for the specification of the required technical components.
  - Power supplies, beam instrumentation, interlocks, and controls and monitoring systems
  - Responsible for installing the IR, commissioning it, and integrating it into accelerator operations.

Roles and Responsibility highlights

- TD
  - Provides resources for the IR subproject
  - Responsible for providing magnets, spool pieces, and other technical components of the IR.
- FESS
  - Facilities Engineering Services Section (FESS) is providing the most of the resources for the C0 Outfitting subproject., WBS 3.0.
  - Responsible for the design work, bid package preparation, contract supervision, inspection and acceptance of the work comprising the C0 Outfitting subproject.
- Project Office
  - Roles, responsibilities and staffing all outlined

Change Control

- Once BTeV is Baselined at CD-2 we will institute a formal change control process
- Performance measurement baselines must be managed after CD-2 in a manner that ensures that they are not modified without appropriate approval
- Hierarchy of change officials with clear approval levels, and a method for receiving, reviewing, and dispositioning proposed changes.
  - Changes to cost, schedule, or technical equipment will all be subject to an approval process
    - 6 levels of change control
  - Project will make changes as it proceeds, so project members need to understand the process

Change Control Thresholds

	Secretarial Acquisition Executive (Level 0)	Acquisition Executive (Level 1)	DOE BTeV Project Director (Level 2)
Technical	Any change in scope and/or performance that affects mission need requirements.	Addition or deletion of major subsystem.	
Schedule	6 month or greater increase (cumulative) in the original project completion date.	Any change to Tier 1 milestones.	Any change to Tier 2 milestones (see PMP).
Cost	Increase in excess of $25M or 25% (cumulative) of the original cost baseline.	Any increase in Total Project Cost and/or increase in Total Estimated Cost.	Any use of contingency that would take the contingency as percentage of TEC ETC below 28%.

Change Control Thresholds

	Fermilab Deputy Director (Level 3)	BTeV Project Manager (Level 4)	Subproject Manager (Level 5)
Technical	Major technical changes that are significant departures from the technical baseline. Changes that affect ES&H requirements or impact accelerator systems. Out-of-scope changes to upgrade physics capabilities.	Related technical changes to multiple subprojects that do not diminish performance .	Minor technical changes to a single subproject that do not diminish performance.
Schedule	Any change that results in the delay of a Tier 3 Director's milestone.	Any change that results in the delay of a Tier 4 milestone by more than one month.	Any change that results in the delay of a Tier 5 milestone by more than one month
Cost	Increase in the cost of a single item by more than $100K. Increase in the Project base cost exceeding $.25M during the previous 12 months.	Increase in the cost of a single item by more than $10K. Increase in a subsystem base cost exceeding 10% during the previous 12 months.	Increase in the cost of a single item by less than $10K.

Schedule - Baseline Completion

Subsystem	Technical Definition of Completion
1.1 Magnets, Toroids, Beam pipes	Operation of all magnets in C0 IR at design current and verification of design field, vacuum pumped down to acceptable level
1.2 Silicon Detector	System test with successful readout of 60 stations.
1.3 RICH	System test with 95% all sensors operational successful. Observation of Rings from Cosmic rays or beam spray
1.4 EMCAL	System test with all 95% of all crystals successful. Observation of signals from pulsers on each channel.
1.5 Muon Detector	System test with all planes at voltage and successfully read out. Observation of signals from cosmic rays.
1.6 Forward Straw Tracker	System test with all planes at voltage and successfully read out. Observation of signals from cosmic rays.
1.7 Forward Microstrip Tracker	System test with all planes at depletion voltage and noise observed on all channels.
1.8 Trigger	Complete system installed and interfaced to pixel and muon systems and meeting requirements based on checkout with simulated data
1.9 Data Acquisition	Readout of all detectors and observation of either noise signals, pulser signals, or cosmic rays depending on the detector
1.10 Integration	Complete installation of detector, with all components having all services required to operate, and all detectors interfaced to data acquisition and slow controls
2.0 C0 Interaction Region	All magnet and ES separator components surveyed on the beamline and operating at full power. All instrumentation and control hardware and software operational/
3.0 C0 Outfitting	All building and Electrical work complete and accepted as meeting the terms specified in the contracts

Schedule Notes - Milestones

- Hierarchical set of milestones have been established to track progress in the Project.
  - Lowest level (Tier 5), a comprehensive set of milestones is distributed throughout the duration of each subproject - Subproject Managers own.
  - Tier 4 milestones; the Project Manager owns.
  - Tier 3 milestones; the Deputy Director owns.
  - Tier 2 milestones; the DOE BTeV Project Manager monitors and holds change control authority for Tier 2 milestones.
  - Tier 1 milestones; the Acquisition Executive monitors and holds change control authority.
  - The Tier 0 CD-4 milestone represents the Critical Decision for the project; the DOE Deputy Secretary monitors and holds change control authority.
- Tier 0-2 milestones have internal and formal dates
  - Do not want to miss recordable milestones
  - Formal dates are reportable, if we miss these, there really is a problem
- Tier 3-5 milestones based on mix of distributed and non-distributed float
  - Ok to miss some of these – especially ones that alert us to issues that connect to Tier 0-2 milestones

Tier 0 Milestones

	Description	Baseline Date
	CD-0: Approve Mission Need	2nd Quarter FY04
	CD-1: Approve Alternative Selection and Cost Range	4th Quarter FY04
	CD-2: Approve Performance Baseline	2nd Quarter FY05
	CD-3a: Approve Limited Construction	2nd Quarter FY05
	CD-3b: Approve Start of Construction	4th Quarter FY05
0.1	CD-4: Approve Start of Operations or Project Closeout	3rdQuarter FY11

Tier 1 Milestones

No.	WBS	Milestone	Date
1.1	2.0	Purchase Order awarded for superconducting wire	Jul. '05
1.2	3.0	Beneficial occupancy of lower level and upper staging area of C0 achieved	Jul. '06
1.3	1.1	Purchase Order awarded for production pixel hybridization	Oct. '06
1.4	1.2	Vertex magnet assembled and installed at C0	Feb. '07
1.5	1.4	50% of $PbWO_4$ Crystals accepted	Apr.. '09
1.6	1.2	Pixel System assembled and tested at SiDet, ready to ship to C0	Jul. '09
1.7	2.0	IR Components that will be installed in tunnel complete, and tested	Oct. '09
1.8	1.4	Final delivery of PbWO4 crystals for the electromagnetic calorimeter completed	Apr. '10
1.9	1.0,1.10	Detector complete and ready for commissioning with beam	Apr. '11

Subproject Documentation

Each SUBPROJECT has:

- **Project Workbook with**
  - WBS dictionary and BoE – In Cost to Level 4 tab, for Drill down use OB
  - Requirements
  - Participants, Group Organization
  - Personnel Expertise
  - Production, Test, QA plan
  - Installation, Test Plan
  - Risk Analysis
  - Contingency Analysis
  - Management Plan
  - Cost to WBS Level 4(OB)
  - Total Construction Cost
  - Total Construction Cost by FY
  - Labor FTE by inst/class by FY
  - M&S Cost by FY
  - Large Procurements
  - TDR (Detector)
  - Breakout talks
- **Cost Books**

There is a complete reference set of these all the subproject Workbooks and Cost books available. Each breakout room will have a few copies of the appropriate books

Obrowser (OB) is a tool that lets you Navigate information extracted from OpenPlan without needing a license
Erik Gottschalk will go over it's use next

Please return Cost Books at the end of the review and save a tree

Project Workbooks

- WBS Dictionary and BOE –
  - Did not print all these out. WBS Dict. To level 4 is included in the "Costs to Level 4" OBrowser tab material.
  - For drilling down into the dictionaries, Erik will do a demo of using OBrowser
- Requirements
  - High level document for each subproject
  - Physics, Geometry, Radiation, Electronics, Readout, etc. as appropriate to each system
- Production, Test, QA plan
  - High level Document with responsible institutions
  - General requirements for component procurement and QA for level 3 and 4 tasks

Project Workbooks

- **Installation, Test Plan**
  - **Tests required before installation**
  - **Listing of tasks, personnel, and time required for each**
- **Risk Analysis**
  - **High level project risks recorded**
  - **Severity = Cost x impact on project**
  - **Mitigations for more severe risks**
- **Contingency Analysis**
  - **Outlines method for determining appropriate cost and schedule contingency to apply to sub-tasks**

Project Workbook

- Management Plan
  - Organization of subproject described
  - Procedures and Practices
  - Reviews
- Cost to WBS Level 4(OB)
  - OBrowser generated costs
  - WBS dictionary notes attached also
- Large Procurements
  - Listing from OP of procurements > $50K w/ Gantt chart
- TDR (Detector)
- Breakout talks

Summary

- Project participants have defined what is to be built, and how it is to be done, and how it will be managed.
  - Generated a lot of documentation which you have
    - Technical specs
    - Management plans
    - Cost and Schedule
- To help you evaluate the cost and schedule:
  - Open Plan schedule contingency demo – Bill Freeman
  - Obrowser Cost and Note Drill Down Usage – Erik Gottschalk